Abstract Submitted for the 49th Annual Meeting
Division of Plasma Physics
November 12-16, 2007, Orlando, Florida

Category Number and Subject: 5.6.2 DIII-D Tokamak

[ ] Theory [X] Experiment

EFIT 3D Reconstruction and Recent Developments,* L.L. Lao, M.S. Chu, H.E. St John, E.J. Strait, A.D. Turnbull, *GA,* Q. Ren, *ASIPP,* Y.M. Jeon, *ORISE,* D. Flannagan, *U. of Tulsa* – Recent 3D extension of the EFIT equilibrium reconstruction code to model toroidally asymmetric effects due to error and externally applied perturbation magnetic fields and other developments are presented. The 3D extension is based on an expansion of the MHD equations. Other developments include a new computational structure based on Fortran 90/95 with a unified interface that can conveniently accommodate different tokamak devices and grid sizes, as well as a Python-based GUI. New computational links that allow easy integration with transport and stability physics modules to facilitate kinetic reconstruction and stability analysis are also being developed. A new more complete uncertainty matrix for magnetic diagnostics based on knowledge about their fabrication, installation, calibration, and operation has also been implemented into EFIT and tested. Reconstructions with the new magnetic uncertainty matrix yield results similar to those using the existing one but with more realistic fitting merit figures.

*Work supported by US DOE under DE-FC02-04ER54698, DE-FG03-95ER54309, and DE-AC05-76OR00033.